

- [54] POWER DRIVEN KITE STRING REEL
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[51] Int. Cl. B65h 75/40
[58] Field of Search 242/96, 54 R, 84.1 A; 244/155 R, 155 A

- [56] **References Cited**
UNITED STATES PATENTS
3,030,733 4/1962 Crawford 242/84.1 A
3,202,378 8/1965 Williamson 242/84.1 A
3,593,940 7/1971 Stanton 242/96

Primary Examiner—John W. Huckert
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[57] **ABSTRACT**
A power driven kite string reel comprising a motor and speed reduction gear mounting box for mounting a connected reversible motor and speed reduction gears, a reel assembly having an axis of rotation supported for rotation on the box and engaged with the speed reduction gears to be driven thereby in opposite directions, a single handle assembly secured to the box having a longitudinal axis substantially perpendicular to the axis of rotation of the reel assembly including a source of electrical energy and switch means for connecting the source of electrical energy to the motor for reversibly driving the motor to wind up or unwind string connected to the reel assembly.

8 Claims, 3 Drawing Figures

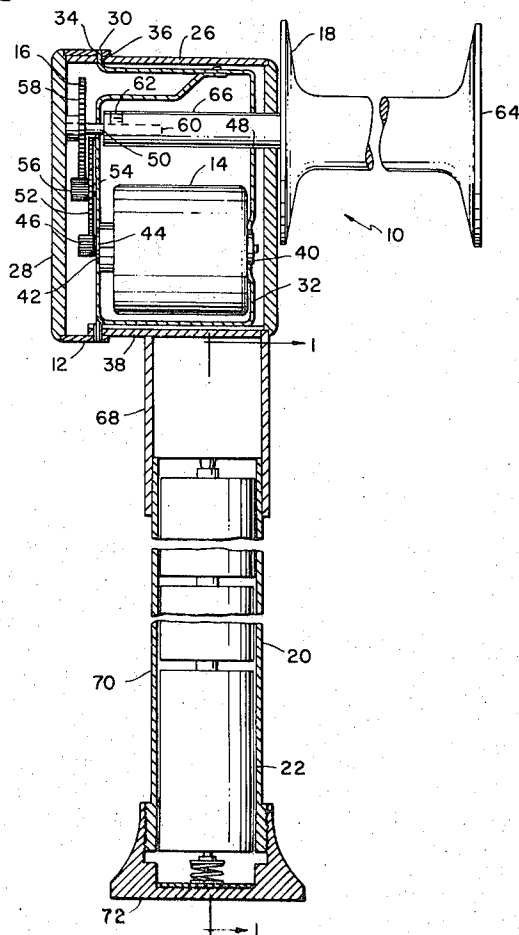


FIG. 2

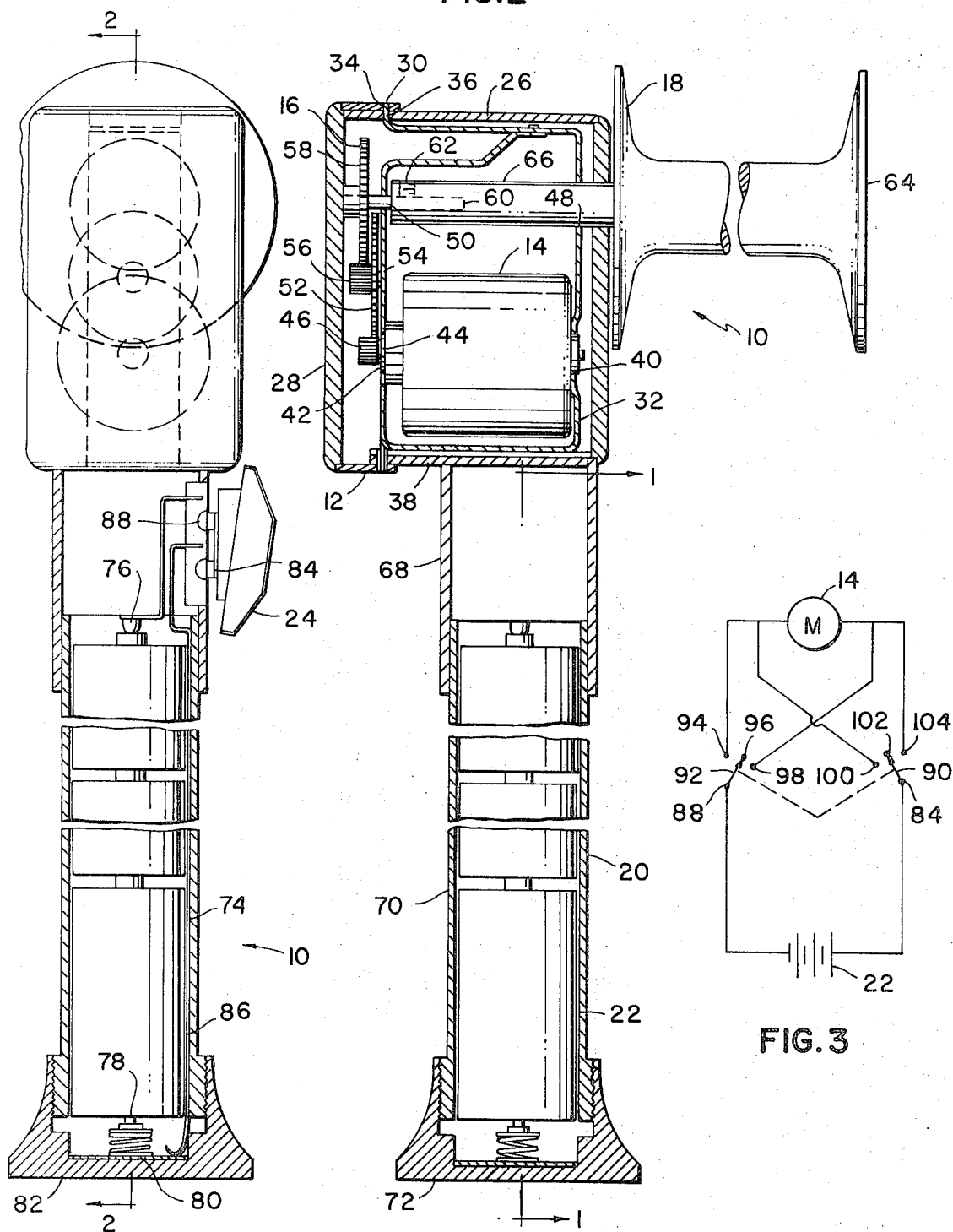


FIG. 1

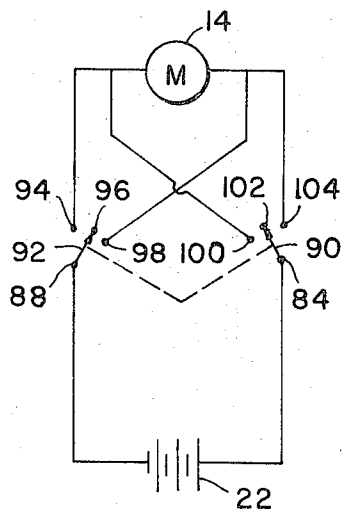


FIG. 3

POWER DRIVEN KITE STRING REEL

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to automatic reel devices and refers more specifically to a power driven kite string reel for winding and unwinding kite string or the like.

2. Description of the Prior Art

In the past, kite strings have usually been wound in balls or on sticks and the like to prevent tangling of loose string. Hand-operated reels have also been provided in the past which have often been cumbersome and sometimes ineffective. Examples of such devices are shown in U.S. Pat. Nos. 3,338,536 and 2,388,478.

Recently, there has been some attempt at providing power driven kite string reels as for example shown in U.S. Pat. No. 3,593,940. However, present automatic kite string reels are relatively complex and therefore difficult to manufacture, and expensive. In addition, all of the known kite string winding apparatus and methods as set forth above have generally been inefficient.

SUMMARY OF THE INVENTION

It is therefore one of the objects of the present invention to provide a relatively simple, easy to manufacture, and therefore economical power driven kite string reel which is efficient in operation.

Accordingly, there is disclosed herein a power driven kite string reel comprising a motor and speed reduction gear mounting box for mounting a reversible motor and speed reduction gears engaged with the motor, a reel assembly mounted on the box for rotation about an axis of rotation through the reel assembly on which it is possible to wind and from which it is possible to unwind a kite string, and a single handle assembly secured to the box substantially perpendicular to the reel assembly including a source of electrical energy carried therein and a switch for connecting the motor to the source of electrical energy to reversibly drive the motor and therefore the reel assembly through the speed reduction gears.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevation view of the power driven kite string reel of the invention, a portion of the handle of which is in section, substantially on the line 1—1 in FIG. 2.

FIG. 2 is a section view through the power driven kite string reel shown in FIG. 1, taken substantially on the line 2—2 in FIG. 1.

FIG. 3 is a schematic diagram of the electrical circuit of the power driven kite string reel shown in FIGS. 1 and 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in FIGS. 1 and 2, the power driven kite string reel 10 includes a motor and speed reduction gear mounting box 12 for mounting motor 14 and speed reduction gears 16. The power driven kite string reel 10 further includes the reel assembly 18 and the handle assembly 20 including a source of electrical energy 22 and switch 24 for connecting the source of

electrical energy 22 to the motor 14 whereby the reel assembly 18 is driven through the speed reduction gears 16.

More specifically, the box 12 includes a body 26 which is substantially rectangular and has one open side. The cover 28 is positioned over the open side of the body 26. The cover 28 is secured to the body 26 by the flanges 30 on the mounting frame 32 extending through slots 34 and 36 at the periphery of the body 26 and cover 28 of the box 12.

The mounting frame 32 is a part of the box 12 and is secured in a fixed position within the body 26 by the flanges 30 on a plate 38. The mounting frame 32 includes openings 40 and 42 therethrough in which the motor 14 is mounted to permit rotation of the motor shaft 44 connected to the pinion 46 of the speed reduction gears 16 on the motor 14 being energized. In addition, the mounting frame 32 has the openings 48 and 50 therethrough in which the reel assembly 18 is rotatably supported.

The motor 14 is a reversible direct current electric motor. Thus, on connecting a source of direct current electrical energy to the motor 14, the pinion 46 will be rotated in opposite directions, depending on the direction of current flow through the motor 14, or in other words, the polarity of electrical energy fed to the motor 14.

The speed reduction gears 16 include the pinion 46 secured to the motor shaft 44, the gear 52 rotatably mounted on the mounting frame 32 on the stub shaft 54, the pinion 56 also mounted on the stub shaft 54 for rotation with gear 52, and the gear 58 secured to the shaft 60 for rotation therewith. Shaft 60 is connected at one end to the reel assembly 18 by the set screw 62 and is passed through the opening 50 on the mounting frame 32 to receive the gear 58 at the other end thereof.

As shown best in FIG. 2, the pinion 46 is meshed with the gear 52, and the pinion 56 which rotates with the gear 52 is meshed with the gear 58. The gear 58 is in turn secured to the shaft 60 for rotation therewith. Thus, on rotation of the motor 14, the shaft 60 will be rotated in a direction depending on the direction of rotation of the motor 14.

The reel assembly 18 includes the spool 64 and the shaft 66. The spool 64 is secured to one end of the shaft 66 for rotation therewith about the axis of generation of the shaft 66 and the spool 64. As indicated above, the other end of the shaft 66 is secured to the shaft 60 for rotation therewith, whereby on rotation of shaft 60, the spool 64 will rotate in a direction depending on the direction of current through the motor 14.

The handle assembly 20 includes the hood 68 secured to the body 26 of the box 12, the tubular portion 70 secured to the hood 68, and the end cover 72 secured to the other end of the tubular portion 70.

As shown diagrammatically in FIG. 1, the switch 24 is positioned on the hood 68 of the handle 20 and has three separate positions, best shown in FIG. 3. The circuit of FIG. 3 will be explained in more detail in conjunction with the overall operation of the power driven kite string reel set forth below.

The source of electrical energy 22 as shown in FIGS. 1 and 2 is three dry cell batteries 74 of the type used in a common flashlight. The battery connections to the switch 24 are diagrammatically indicated best in FIG. 1 and include an upper terminal 76 adapted to be en-

gaged with the center terminal of the battery 74 and the electrode 78 held against the bottom of the lower battery 74 by the spring 80 and the plate 82. The plate 82 is in turn connected to the lower terminal 84 of the switch 24 by a resilient connector 86, while the upper terminal 76 is adapted to be connected to the terminal 88 of the switch 24 in one position thereof.

The other portions of the circuit illustrated in FIG. 3 will now be considered in conjunction with the overall operation of the power driven kite string reel 10. As shown in FIG. 3, the switch 24 has two separate parts 90 and 92 which are mechanically connected together and which are movable into three separate positions. The switch part 92 may be moved into contact with terminals 94, 96 or 98, while the switch part 90 may be moved into engagement with the contacts 100, 102 and 104. Thus, since terminals 84 and 88 are connected to the opposite terminals of the source of electrical energy 22 when the switch parts 90 and 92 are connected to terminals 94 and 104 in one position of the switch 24, current flows in one direction through the motor 14. When the switch parts 90 and 92 are moved together into contact with the terminals 96 and 102, the motor 14 is deenergized. When the switch parts 90 and 92 are moved together into contact with the terminals 98 and 100, the current will flow in the opposite direction through motor 14.

Thus, the reel 10 with a kite string secured to the spool 64 may be actuated by for example moving the switch 24 down to a lowermost position as illustrated in FIG. 1 to cause the contacts 94 and 104 to be engaged whereby the kite string will be wound on the spool 18 moving in one direction.

A desired length of string may be left unwound on moving the switch 24 to a central position to engage contacts 96 and 102 and the kite may be put into flight in the usual manner.

With the kite in flight, the switch 24 may be moved into an upper position, whereby the contacts 98 and 100 are engaged to unwind the string from the spool 64 to cause the kite to flow as desired to, for example, allow added height or for maneuvering. Winding and unwinding of the kite string may be continued by manipulation of the switch 24 to wind and unwind the kite string, as desired.

In particular, it is desired to point out that with the power driven kite string reel 10 of the invention, only one hand is required to operate the kite string reel and to provide winding and unwinding of the kite string with the thumb on the switch 24.

It will be understood that with the specific structure disclosed, applicant provides a simple, easy to produce and therefore economical power driven kite string reel. Further, the power driven kite string reel disclosed is efficient in, for example, requiring only one hand to operate. Also, the string pull is always substantially in line with the handle 70, being offset only slightly therefrom on the spool 64 to provide the usual feel of the kite string essential to skilled kite flying.

While one embodiment of the invention has been considered in detail, it will be understood that other embodiments and modifications are contemplated by the inventor. Thus, for example, if it is desired to have the spool free wheeling in one direction, it would be possible to provide a one-way clutch between the spool 18 and the shaft 66 with appropriate actuating structure such as a mechanical button on the box 12, or a

second electrical switch positioned on the hood 68. Also, for example, pressure actuated action of the spool 64 could easily be provided. It is therefore the intention to include all embodiments and modifications of the power driven kite reel disclosed as are defined by the appended claims within the scope of the invention.

What I claim as my invention is:

1. A power driven kite string reel comprising a motor and speed reduction gear mounting box, a reversible motor and speed reduction gears connected to the motor mounted in the box, a kite string reel assembly having an axis of rotation and comprising a drive shaft mounted in and supported by the gear box and connected at one end to the speed reduction gears for rotation about its axis of rotation and secured at the other end to a spool disposed exteriorly of the gear mount box about which the kite string may be wound, and a single handle assembly secured to the box having a longitudinal axis substantially perpendicular to the axis of rotation of the reel assembly including a source of electrical energy, and switch means for selectively connecting the source of electrical energy to the motor so that the motor will cause the reel to selectively rotate in opposite directions.

2. Structure as set forth in claim 1 wherein the box includes a body member having a generally rectangular shape open at one side, a cover positioned over the open side of the box and a mounting frame positioned within the body of the box for mounting the motor and speed reduction gears.

3. Structure as set forth in claim 2 wherein the box includes aligned slots in the periphery of the body and cover of the box, and projecting flanges on the mounting frame extending into the aligned slots to secure the mounting frame, body and cover in assembly.

4. Structure as set forth in claim 3 wherein the handle includes a hood portion secured to the box for housing electrical connectors and carrying the switch means, a tubular portion secured to the hood at one end for carrying storage batteries as the source of electrical energy, and an end cap positioned over the other end of the tubular member.

5. Structure as set forth in claim 4 wherein the switch is a three-position switch including a first position for connecting electrical energy from the source of electrical energy to pass through the motor in one direction, a second position for disconnecting the electrical energy from the motor, and a third position for connecting the electrical energy to the motor to pass through the motor in a direction opposite the one direction.

6. Structure as set forth in claim 1 wherein the handle assembly includes a hood portion secured to the box for housing electrical connectors and carrying the switch means, a tubular portion secured to the hood at one end for carrying storage batteries as the source of electrical energy, and an end cap positioned over the other end of the tubular member.

7. Structure as set forth in claim 1 wherein the switch means is a three-position switch including a first position for connecting electrical energy from the source of electrical energy to pass through the motor in one direction, a second position for disconnecting the electrical energy from the motor, and a third position for connecting the electrical energy to the motor to pass through the motor in a direction opposite the one direction.

8. The structure as set forth in claim 2 wherein said body member includes an opening in the side opposite the open side through which one end of the drive shaft extends for a limited distance exteriorly of the box, said exteriorly extending end of said drive shaft being secured to the spool exteriorly of said box.

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